9-10-1968

Test 985: International 444 (Gasoline)

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 985 - INTERNATIONAL 444 GASOLINE

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption: Gal per hr	Fuel Consumption: Lb per hp-hr	Fuel Consumption: Hp-hr per gal	Temperature Degrees F: Cooling medium	Temperature Degrees F: Air wet bulb	Temperature Degrees F: Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours								
38.09*	2000	3.410	0.554	11.17	192	62	75	29.000
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
34.12	2107	3.327	0.603	10.26	185	62	75	.....
0.00	2203	1.329	.....	.....	175	61	74	.....
17.37	2147	2.279	0.812	7.62	180	61	74	.....
38.43	2000	3.404	0.548	11.29	190	62	75	.....
8.86	2190	1.833	1.280	4.83	176	62	76	.....
25.79	2124	2.716	0.651	9.50	182	62	76	.....
Av 20.76	**2128**	**2.481**	**0.739**	**8.37**	**181**	**62**	**75**	**29.048**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Slip of drivers %	Fuel Consumption: Gal per hr	Fuel Consumption: Lb per hp-hr	Fuel Consumption: Hp-hr per gal	Temp Degrees F: Cool-ing med	Temp Degrees F: Air wet bulb	Temp Degrees F: Air dry bulb	Barom-eter inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours—5th Gear (4th Low)											
32.94	2384	5.18	2002	4.25	3.423	0.643	9.62	199	57	75	29.040
75% of Pull at Maximum Power—Ten Hours—5th Gear (4th Low)											
26.85	1814	5.55	2122	3.21	3.171	0.731	8.47	187	61	74	28.952
50% of Pull at Maximum Power—Two Hours—5th Gear (4th Low)											
19.44	1279	5.70	2165	2.59	2.635	0.838	7.38	184	48	50	29.030
MAXIMUM POWER WITH BALLAST											
19.89	5494	1.36	2142	14.78	1st Gear (1st Low)			181	58	72	29.110
31.50	5314	2.22	2002	12.50	2nd Gear (2nd Low)			185	58	71	29.110
32.64	3640	3.36	2001	7.06	3rd Gear (3rd Low)			187	58	75	29.090
32.95	3020	4.09	2001	4.09	4th Gear (1st High)			187	57	74	29.090
33.11	2398	5.18	2001	4.22	5th Gear (4th Low)			182	58	71	29.090
32.77	1712	7.18	2003	3.06	6th Gear (2nd High)			188	56	75	29.060
31.74	1149	10.36	2005	1.99	7th Gear (3rd High)			185	57	75	29.090
MAXIMUM PULL WITHOUT BALLAST											
29.99	3472	3.24	2073	14.97	3rd Gear (3rd Low)			180	58	66	28.980

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST
5th Gear (4th Low)

Pounds pull	2398	2550	2677	2743	2724	2648
Horsepower	33.11	31.72	29.35	26.32	22.30	18.25
Crankshaft speed, rpm	2001	1805	1598	1399	1193	1003
Miles per hour	5.18	4.67	4.11	3.60	3.07	2.58
Slip of drivers, %	4.22	4.34	4.79	4.79	4.79	5.13

TIRES, BALLAST and WEIGHT		With Ballast	Without Ballast
Rear tires	—No, size, ply & psi	Two 13.6-28; 6; 16	13.6-28; 6; 12
Ballast	—Liquid	498 lb each	None
	Cast iron	700 lb each	None
Front tires	—No, size, ply & psi	Two 6.00-16; 4; 32	Two 6.00-16; 4; 32
Ballast	—Liquid	None	None
	Cast iron	178 lb each	None
Height of drawbar		17 inches	18 inches
Static weight with operator—Rear		5025 lb	2630 lb
	Front	1855 lb	1500 lb
	Total	6880 lb	4130 lb

Department of Agricultural Engineering

Dates of Test: SEPTEMBER 10 to SEPTEMBER 27, 1968

Manufacturer: INTERNATIONAL HARVESTER COMPANY, CHICAGO, ILLINOIS

FUEL, OIL and TIME **Fuel** regular gasoline **Octane No** Motor 85.5 Research 93.2 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.7431 **Weight per gallon** 6.186 lb **Oil** SAE 30 **API service classification** MS, DM **To motor** 1.435 gal **Drained from motor** 1.188 gal **Transmission and final drive lubricant** IH Hy-Tran Fluid **Total time engine was operated** 45½ hours.

ENGINE **Make** International **Type** 4 cylinder vertical **Serial No** 35721 **Crankshaft mounted** lengthwise **Rated rpm** 2000 **Bore and stroke** 3.375" x 4.25" **Compression ratio** 7.5 to 1 **Displacement** 152.1 cu in **Carburetor size** ⅞" **Ignition system** battery **Cranking system** 12 volt electric **Lubrication** pressure **Air cleaner** 2-stage dry-type with replaceable element and dust unloader **Oil filter** full flow with replaceable paper element **Oil cooler** None **Fuel filter** sediment bowl and screen **Muffler** was used **Cooling medium temperature control** thermostat.

CHASSIS **Type** Standard **Serial No** 01825 **Tread width** rear 52" to 80" front 53" to 77" **Wheel base** 70" **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 26.6" Vertical distance above roadway 28" Horizontal distance from center of rear wheel tread 0" to the right/left **Hydraulic control system** direct engine **Transmission** selective gear fixed ratio **Advertised speeds mph** first 1.5 second 2.5 third 3.5 fourth 4.25 fifth 5.25 sixth 7.25 seventh 10.25 eighth 15.5 **Clutch** single plate dry disc operated by single foot pedal **Brakes** dry double disc mechanically operated by two foot pedals which can be locked **Steering** hydrostatic power **Turning radius** (on concrete surface with brake applied) right 98" left 98" (on concrete surface without brake) right 125" left 125" **Turning space diameter** (on concrete surface with brake applied) right 204" left 204" (on concrete surface without brake) right 260" left 260" **Belt pulley** 1286 rpm at 2000 engine rpm diam 9½" face 6¾" **Belt speed** 3198 fpm **Power take-off** 545 rpm at 2000 engine rpm.

REPAIRS and ADJUSTMENTS No repairs or adjustments.

REMARKS All test results were determined from observed data obtained in accordance with the SAE and ASAE test code. Eighth gear was not run as it exceeded 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. 985.

L. F. LARSEN
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
D. E. LANE
Board of Tractor Test Engineers

The University of Nebraska Agricultural Experiment Station
E. F. Frolik, Dean; H. W. Ottoson, Director; Lincoln, Nebraska

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories can be disconnected only when it is convenient for the operator to do so in practice. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. The tire tread-bar height must be at least 65% of new tread height prior to the maximum power run.

BELT OR POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the belt pulley or the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, ½ of the 85% torque; maximum power, ¼ and ¾ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general usage.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests. If the manufacturer specifies a different rated crankshaft speed for drawbar operations, then the position of the manually operated governor control is changed to provide the high-idle speed specified by the manufacturer in the operating instructions.

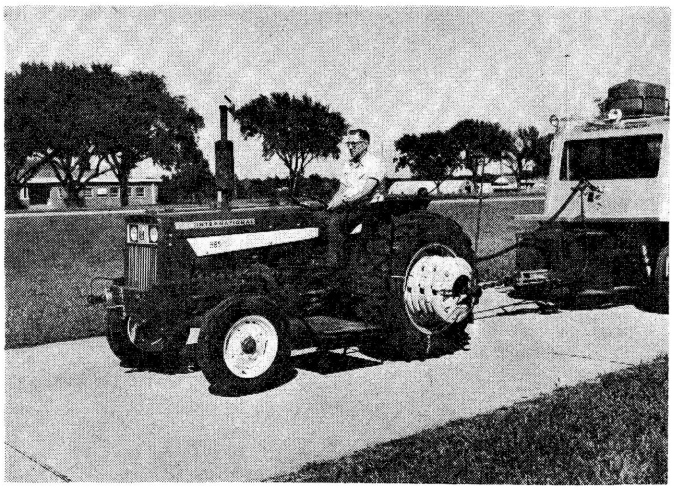
Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effect of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 3 different levels as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; and (3) 50% of the pull at maximum power. Prior to 1958, fuel consumption data (10 hour test) were shown only for the pull obtained at maximum power for tractors having torque converters and at 75% of the pull obtained at maximum power for gear-type tractors.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 12 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe-limit for the test course. The maximum safe speed for the Nebraska Test Course has been set at 15 miles per hour. The slippage limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

Maximum Pull without Ballast. All added ballast is removed from the tractor. The drawbar pull is determined at slip limits of 15% for pneumatic tires or 7% for steel tracks or lugs. The tractor is operated at the fastest possible travel speed.

Varying Power and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

For additional information about the **Nebraska Tractor Tests** write to the **Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska.**



INTERNATIONAL 444 GASOLINE